Protocol Development Summary

NETN Protocol: Weather and Climate

NETN parks where protocol will be implemented:
Acadia NP (ACAD), Appalachian NST (APPA), Boston Harbor Islands NRA (BOHA), Marsh-Billings-Rockefeller NHP (MABI), Minute Man NHP (MIMA), Morristown NHP (MORR), Roosevelt-Vanderbuilt NHS (ROVA), Saint-Gaudens NHS (SAGA), Saratoga NHP (SARA), Saugus Iron Works NHS (SAIR), Weir Farm NHS (WEFA)

Justification/issues being addressed:
Temperature and precipitation, taken over time scales of years, decades or longer, are the basic components of climate. Climate provides the physical constraints that determine plant and animal survival and drives the basic processes that underpin ecosystems. Current climate models predict substantial climate-related changes in the northeast, and this will result in ecological changes. Potential changes include: (1) changes in forest species composition (e.g., loss of sugar maples), (2) increased frequency of heavy precipitation events and flooding, and (3) an overall increase in the heat index of 8-20 ºF (National Assessment Synthesis Team 2000).

Monitoring the basic components of climate will help to discern whether these predictions are accurate for the NETN, and will help managers anticipate potential changes that will affect parks. For example, increased severity and frequency of rainfall events could cause flooding of low-lying areas, and convert vernal pools to year-round pools (with potential consequences for amphibian species).

Specific monitoring questions and objectives to be addressed by the protocol:

1) Do climate trends (i.e., temp, precipitation) correlate with other network monitoring programs?
2) Can any changes in vegetation or other biological components be attributed to changes in climate?

The objectives of this protocol are to:

1) Determine long-term trends in average monthly maximum temperature, average monthly minimum temperature, average monthly mean temperature, and total monthly precipitation in NETN parks.
2) Correlate weather trends with trends observed in data collected with other protocols (e.g., phenology) to determine the extent to which weather trends can explain trends in monitoring data.

Basic approach:
Weather monitoring is currently being conducted in or near all parks in the NETN. The data are currently managed by the National Oceanic and Air Administration (NOAA).

The NETN will acquire these data on a yearly basis, summarize them, and provide results to NETN parks. The network will also use these data to inform trend analyses.

Principal investigators and NPS lead:

The NPS Lead is Brian Mitchell, NETN coordinator.

Development schedule, budget, and expected interim products:
Protocol development will consist primarily of writing a protocol that meets NPS standards (Oakley et al. 2003) and incorporates existing standard protocols. We will need to write new sections in the protocol narrative and SOPs to make the standard protocols specific to NETN parks, such as describing nearest sampling locations and documenting how data will be entered into NPS computers, analyzed, and reported.

Protocol development is currently on hold pending the development of a national weather protocol.

Literature cited:
National Assessment Synthesis Team 2000. Climate change impacts on the United States: Potential consequences of climate variability and change. US Global Change Research Program.
Oakley, K., L. Thomas, and S. Fancy 2003. Guidelines for long-term monitoring protocols. Wildlife Society Bulletin 31:1-3.